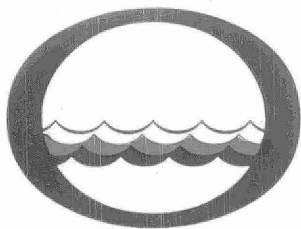


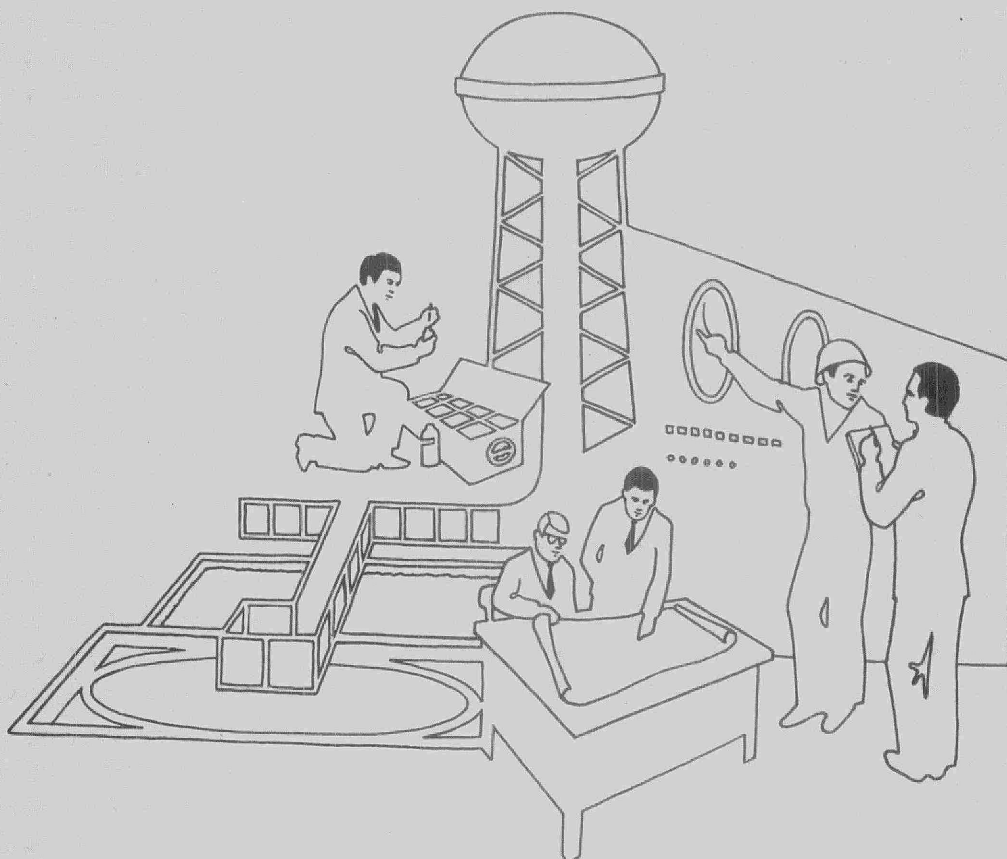
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Water management in Ontario

Ontario
Water Resources
Commission

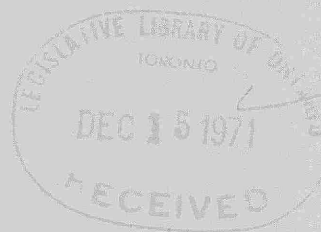
District
Engineers
Branch



TOWN OF LISTOWEL

WATER POLLUTION SURVEY

JUNE, AUGUST 1971



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REPORT
ON A
WATER POLLUTION SURVEY
OF THE
TOWN OF LISTOWEL
COUNTY OF PERTH

JUNE, AUGUST 1971
DISTRICT ENGINEERS BRANCH
DIVISION OF SANITARY ENGINEERING



ONTARIO WATER RESOURCES COMMISSION

REPORT

GENERAL

The Town of Listowel is situated in the northern part of Perth County at the junction of Highway No. 23 and Highway No. 86. The middle branch of the Maitland River flows through the Town from the east to the west. The surrounding areas are farmland used mainly for beef cattle and dairy operations. The population has increased over the past ten years by approximately 800 people. The main portion of the population growth took place in the years 1960 to 1965. From 1965 to 1970 the population remained fairly constant with an increase of only 100 people. The 1970 population is given as 4,512 persons.

SEWER SYSTEM

The existing sewer system consists of separate sanitary collector sewers and two trunk sewers to the existing pumping station at the south side of the Middle Maitland River. From here, the wastes are pumped to a two-celled waste stabilization pond with a total area of 69 acres. The capacity of the treatment works is presently being increased by the addition of an aerated cell for pretreatment. A map outlining the sewer system is provided in Appendix I.

The Union Street West trunk sewer serves roughly that portion of the Town of Listowel, which lies to the east of Barber Avenue. The main collector sewers of this system were built prior to 1959. Several lateral and collector sewers have been added to the sewer system during the past ten years to serve existing development as well as some new subdivisions. Although this system covers a large portion of the town east of Barber Avenue, there are still some areas in the south and east part of the town for which sewers are not yet available.

The Elma Street West trunk sewer serves roughly that portion of the town which lies to the west of Barber Avenue. To date the trunk sewer and approximately one-fourth of the collector system have been constructed.

It is anticipated that the remaining portions of the sanitary sewer collector system will be built in the near future.

An engineering report is being prepared and is scheduled for completion in September, 1971.

Reportedly during and after rainy periods a higher flow is experienced in the sanitary sewer system than is expected from the domestic and industrial sources alone. During the spring thaw period it also appears that large quantities of drainage water infiltrates into the sanitary sewer system. Since the sanitary sewer system is not designed and constructed for the conveyance of storm water and drainage water, these sources of infiltration should be investigated and eliminated when found to be excessive.

SURVEY

A water pollution survey was performed under dry weather conditions on June 30, 1971 by staff of the District Engineers Branch. During this survey drains in the Town of Listowel were examined to estimate the level of pollution that could be attributed to discharges from these drains to the Maitland River. The location of sampling points is shown on Appendix I. The results of this survey are provided in Table I, appended to this report.

Several of the drains were resampled on August 17, 1971. The results of these samples are also presented in Table I.

DISCUSSION OF SURVEY RESULTS

In general, the results of the water pollution survey indicate the presence of pollutants in most of the drains. For interpretation purposes these drains can be divided into two groups.

Unsewered Areas

The first group consists of those drains which are located in unsewered areas. The Walton Avenue Drain, the Maitland Avenue Drain and the Albert Avenue Drain belong in this category. The most significant flow comes from the Albert Avenue Drain. This drain is obviously conveying domestic wastes from malfunctioning septic tanks. This source of pollution should be eliminated when sanitary sewers are made available for the developed area west of Barber Avenue.

The construction of sewers for the developed areas in the east part of the Town will eliminate the minor problems in the Walton Avenue Drain and the Maitland Avenue Drain. Currently, an engineering report is being prepared by Gore and Storrie Limited, Consulting Engineers. This report, scheduled for completion in September, 1971, will contain detailed information on the sewer needs for the town.

Sewered Areas

The second group consists of those drains, which lie predominantly in sewered areas. The chemical analyses results reveal that the five-day BOD level in several of the drains was of satisfactory quality (sampling locations 3, 5, 8, 9, 10 and 12) on June 30, 1970. However, the BOD₅ concentrations at locations 3, 5 and 8 were considerably increased at the time of the August 17th sampling. Faecal coliforms were present in all samples taken from the above-mentioned drains. Since faecal coliform organisms are bacteria which live in the intestines of warm blooded animals and human beings, the presence of these could indicate that domestic wastes gain access to these drains.

During the surveys a smell of sanitary sewage was noticed at sampling locations Nos. 3, 5 and 8. Rags and paper were noticed at sampling location No. 5 during the follow-up survey. Black deposits, indicative of sanitary sewage discharge to open watercourses, and also oil were noticed in the drain at the Hays Coal Yard (No. 8). At the June 30th survey this drainage water was clear in appearance. From the above it is clear that sanitary wastes were gaining access to at least three of the above-mentioned drains (Nos. 3, 5 and 8).

Although the quantity of wastes reaching the river by these routes is limited, action is needed to locate the sources of waste input into these drains and re-route them to the sanitary sewer system. In regard to the other drains (9, 10 and 12), mentioned above, future monitoring of the drainage water quality should be undertaken to establish if the results found reflect natural conditions.

Three other drains, also lying in the predominantly sewered area, had BOD₅ levels too high for natural drains. In regard to the tile, south of Target Discount Store, (No. 7), it is evident that a direct connection from a septic tank does exist here. The connection in question should be investigated and the domestic flow be directed to the sanitary sewer system.

In regard to the Elma Street West Drain (No. 6), a valid reason why this drain conveys organic matter could not be established. The drainage water during both surveys was clear in appearance and no deposits of black sludge, indicative of untreated sanitary sewage discharge, was noticed. The rate of flow was also higher than one would expect from a drain under the survey conditions. Contaminated cooling water from an industrial operation could be the source of pollution. To date, no indication exists as to the source of these wastes. Strong efforts should be made to find the source of pollution and remedial action should be initiated.

The Wallace Avenue North Drain (No. 4) revealed a high concentration of BOD₅ and coliform organisms during the June 30th survey. At that time an odour of sanitary sewage was noticed and black deposits of sludge were present at the outfall. However, during August 17th survey the appearance of the drainage water was clear and no deposits or odours could be detected, and the BOD₅ indicated the flow did not contain organic contaminants. The rate of flow was slightly less than during the previous survey. A satisfactory explanation cannot be given at this time for the above observations. This drain as well as the Elma Street West Drain should be kept under surveillance to discover the pollution sources and to sever them from these drains.

SUMMARY

The Town of Listowel is served by a separate sanitary sewer system which covers to date approximately 75 per cent of the town. During the spring thaw period and during rainy periods a higher flow is experienced in the sanitary sewer system than can be expected from the domestic and industrial sources. The sources of infiltration should be investigated and eliminated if found excessive.

The pollution surveys conducted on June 30, 1971 and August 17, 1971 revealed the presence of pollutants in most of the outlet drains to the Middle Maitland River. The main waste contribution from the unsewered area came from the Albert Avenue Drain. An engineering study is underway, which will contain detailed information on the town's sewer needs. This source of pollution should be eliminated when sanitary sewers are made available for that section of town.

The main waste contributions from the drains, located in the predominantly sewered area, came from the Wallace Avenue North Drain (No. 4) and the Elma Street West Drain (No. 6). To

date a satisfactory explanation cannot be given for the presence of pollutants in these drains. These drains should be kept under surveillance to discover the pollution sources and to eliminate them.

In regard to the other drains, the survey results revealed that untreated sanitary sewage was gaining access to most of these drains. These connections should be located and re-routed to the sanitary sewer system.

RECOMMENDATIONS:

1. The developed unsewered areas in the town should be served by sanitary sewers as soon as possible. Special emphasis should be placed on the construction of sewers for the north-west section of the town.
2. Improper private connections to the municipal drains should be severed because they are deemed to be the main source of pollutants in these drains. Special emphasis should be placed on locating the sources of discharges to the drains on Wallace Ave. North and Elma Street West (Nos. 4 and 6).
3. The sources of infiltration to the town's sanitary sewer system during rainfalls and spring thaw period should be pursued. Corrective measures should be instituted where possible to curtail this infiltration.

CW B

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C. W. Brink, P. Eng.

CWB/hk

Encls.

WATER POLLUTION SURVEY

TOWN OF LISTOWEL

TABLE I

Sampling Point	Description of Sampling Point	5-Day BOD (ppm)	Solids			Faecal Coliform Count per 100 ml.	MF Coliform Count per 100 ml.	Estimated Flow (gpm)	Date of Survey
			Total (ppm)	Susp. (ppm)	Diss. (ppm)				
1	Catch Basin at foot of Walton Street	14	500	20	480	12,000	4,400,000	½	30 June
2	Maitland Ave. Drain	20	950	110	840	<4	<4	½	30 June
3	North Drain at Queen St. and Davidson Ave.	3.2	600	3	597	680	4,800	Trickle	30 June
		32		20		6,200,000	440,000,000		
4	Wallace St. Drain at bridge	110	420	35	385	2,300	170,000	6	30 June
		<0.5		3		60	14,000	4	17 Aug.
5	West outfall between Main St. and Elma St.	2.8	310	2	308	360	10,000	1	30 June
		>30		5		150	36,000	1	17 Aug.
6	West Drain at Elma St. bridge	75	440	70	370	6,000	60,000	5	30 June
		190		160		340,000	340,000	5	17 Aug.
7	West Tile South of Target Discount	140	550	60	490	30,000	23,000,000	Periodic Flow Dry	30 June 17 Aug.

WATER POLLUTION SURVEYTOWN OF LISTOWELTABLE I

Sampling Point	Description of Sampling Point	5-Day BOD (ppm)	Solids			Faecal Coliform Count per 100 ml.	MF Coliform Count per 100 ml.	Estimated Flow (gpm)	Date of Survey
			Total (ppm)	Susp. (ppm)	Diss. (ppm)				
8	West Drain at Hays Coal Yard	4.8	310	5	305	5,000	80,000	3	30 June
		8		45		9,000	170,000	3	17 Aug.
9	East Drain at Elma St. Bridge	2.0	370	2	368	208	2,900	$\frac{1}{2}$	30 June
		0.6		4		72	1,400	4	17 Aug.
10	East Drain at Elma St. Bridge	4.0	1,000	30	970	20	130,000	Trickle Dry	30 June 17 Aug.
11	Albert Avenue Drain at Main Street	40	650	55	595	290,000	2,200,000	15	30 June
12	East Drain South of Elizabeth Street	2.8	500	1	499	1,200	13,000	$\frac{1}{4}$	30 June



-  — SEWERS CONSTRUCTED PRIOR TO 1959.
 — SEWERS CONSTRUCTED BY THE TOWN FROM 1959 TO 1971.
 — SEWERS CONSTRUCTED IN 1969 / 1970 AS STAGE I OF A STAGED SEWER PROGRAMME.
 — PROPOSED SEWERS.
 — UNSEWERED AREAS
 — DRAIN OUTFALL



ONTARIO WATER RESOURCES COMMISSION

TOWN OF LISTOWEL
WATER POLLUTION SURVEY
1971

SCALE: 100 0 100 200 300 400 500 FEET

DRAWN BY: A.R.S.	DATE: SEPT., 1971
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CHECKED BY:	DRAWING N.º: 71-85-DE
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